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Patent

Case No.: 57078US002

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

First Named Inventor: HAMROCK, STEVEN J.

Application No.: 10/041998 Group Art Unit: 1626

Filed: October 25, 2001 Examiner: Lambkin, Deborah C

Title: ZWITTERIONIC IMIDES

**BRIEF ON APPEAL**

Mail Stop Appeal Brief-Patents  
Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

<b>CERTIFICATE OF MAILING OR TRANSMISSION</b>	
I hereby certify that this correspondence is being transmitted by facsimile on the date shown below to the United States Patent and Trademark Office at (703) 872-9306.	
October 3, 2004	Signed by: Philip Dahl
Date	

Dear Sir:

This is an appeal from the Office Action mailed on May 3, 2004. The fee required under 37 CFR § 41.20(b)(2) for the appeal should be charged to Deposit Account No. 13-3723.

Appellants request the opportunity for a personal appearance before the Board of Appeals to argue the issues of this appeal. The fee for the personal appearance will be timely paid upon receipt of the Examiner's Answer.

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**REAL PARTY IN INTEREST**

The real party in interest is 3M Company (formerly known as Minnesota Mining and Manufacturing Company) of St. Paul, Minnesota and its affiliate 3M Innovative Properties Company of St. Paul, Minnesota.

**RELATED APPEALS AND INTERFERENCES**

Appellants are unaware of any related appeals or interferences.

**STATUS OF CLAIMS**

Claims 1-30 are pending. Claims 19-30 are withdrawn. Claims 1-18 stand rejected.

**STATUS OF AMENDMENTS**

No amendments have been filed after the final rejection.

**SUMMARY OF CLAIMED SUBJECT MATTER**

The claims at issue concern certain zwitterionic imide compounds. These compound may be useful in making polymer electrolyte membranes which may be useful in the manufacture and operation of fuel cells.

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**GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL****Issue A**

Claims 1-18 stand rejected under 35 USC § 112, second paragraph, as purportedly indefinite for failing to particularly point out and distinctly claim the subject matter which Applicant regards as the invention.

**Issue B**

Claim 1 stands rejected under 35 USC § 102(b) as purportedly anticipated by any one of U.S. Patents Nos. 5,723,664, (Sakaguchi); 5,072,040 (Armand); 5,463,005 (Desmarteau); 5,514,493 (Waddell); 5,827,602 (Koch) and 6,090,985 (Mao).

**Issue C**

Claims 1-18 stand rejected under 35 USC § 103(a) as purportedly unpatentable over the combined teachings of Sakaguchi, Armand, Desmarteau, Waddell, Koch and Mao.

**ARGUMENT****Issue A**

Claims 1-18 stand rejected under 35 USC § 112, second paragraph, as purportedly indefinite for failing to particularly point out and distinctly claim the subject matter which Applicant regards as the invention. The Examiner asserts that the claims include improper Markush language.

Applicant submits that the Markush groups are properly formed. For example, from claim 1: "wherein R<sub>1</sub> is selected from the group consisting of straight-chain, branched, cyclic and aromatic groups, . . ." Applicant submits that this is proper Markush language. That language is followed by the clause: ". . . including saturated and unsaturated groups, including heteroatomic groups, and including any of the above which are substituted; . . ." It should be plain that the "including" clause clarifies the variety of species included in the Markush group, but does not alter the scope of the Markush group.

Applicants assert that the rejection of claims 1-18 under 35 USC § 112, second paragraph, should be reversed.

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**Issue B**

Claim 1 stands rejected under 35 USC § 102(b) as purportedly anticipated by any one of U.S. Patents Nos. 5,723,664, (Sakaguchi); 5,072,040 (Armand); 5,463,005 (Desmarreau); 5,514,493 (Waddell); 5,827,602 (Koch) and 6,090,985 (Mao).

Claim 1 recites zwitterionic imide compounds. Zwitterionic compounds are unusual compounds that include both an anionic group and a cationic group. The recited compounds include both an imide function which is an anionic group and a cationic group,  $R_2^+$ . None of the cited references concern zwitterionic compounds, and therefore they cannot anticipate claim 1. The Examiner states that "Applicant must point out precisely where and how the instant compounds differ structurally from that of the prior art." The instant compounds differ structurally from those of the prior art in that they contain both an anionic group and a cationic group, i.e., they are zwitterionic.

Applicants assert that the rejection of claim 1 under 35 USC § 102(b) should be reversed.

**Issue C**

Claims 1-18 stand rejected under 35 USC § 103(a) as purportedly unpatentable over the combined teachings of Sakaguchi, Armand, Desmarreau, Waddell, Koch and Mao.

Claims 1-18 recite zwitterionic imide compounds. Zwitterionic compounds are unusual compounds that include both an anionic group and a cationic group. The recited compounds include both an imide function which is an anionic group and a cationic group,  $R_2^+$ . None of the cited references concern zwitterionic compounds, and therefore no prima facie case of obviousness can be made on the basis of these references. The Examiner states that "Applicant must point out precisely where and how the instant compounds differ structurally from that of the prior art." The instant compounds differ structurally from those of the prior art in that they contain both an anionic group and a cationic group, i.e., they are zwitterionic. In addition, claims 2-8, 11, 12, 15, 17 and 18 include additional limitations regarding cationic group  $R_2^+$  which are also not taught or suggested by the cited references.

Applicants assert that the rejection of claims 1-18 under 35 USC § 103(a) should be reversed.

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**CONCLUSION**

For the foregoing reasons, appellants respectfully submit that the Examiner has erred in rejecting this application. Please reverse the Examiner on all counts.

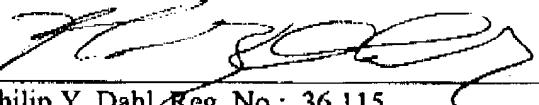
Respectfully submitted,

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October 3, 2004

Date

By:



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Office of Intellectual Property Counsel  
3M Innovative Properties Company  
Facsimile No.: 651-736-3833

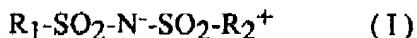
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**Claims Appendix**

1. (Original) A zwitterionic imide compound according to formula (I):



wherein  $R_1$  is selected from the group consisting of straight-chain, branched, cyclic and aromatic groups, including saturated and unsaturated groups, including heteroatomic groups, and including any of the above which are substituted; and

wherein  $R_2^+$  is any cationic group selected from the group consisting of straight-chain, branched, cyclic and aromatic groups, including saturated and unsaturated groups, including heteroatomic groups, and including any of the above which are substituted.

2. (Original) The zwitterionic imide compound according to claim 1, wherein  $R_2^+$  is an aromatic group.

3. (Original) The zwitterionic imide compound according to claim 2, wherein  $R_2^+$  is a heterocyclic group.

4. (Original) The zwitterionic imide compound according to claim 3, wherein  $R_2^+$  contains a cationic nitrogen atom.

5. (Original) The zwitterionic imide compound according to claim 1, wherein  $R_2^+$  contains a functional group selected from the group consisting of: pyridiniumyl, pyridaziniumyl, pyrimidiniumyl, pyraziniumyl, imidazoliumyl, pyrazoliumyl, thiazoliumyl, oxazoliumyl, and triazoliumyl.

6. (Original) The zwitterionic imide compound according to claim 1, wherein  $R_2^+$  contains a quaternary ammonium cation.

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7. (Original) The zwitterionic imide compound according to claim 1, wherein R<sub>2</sub><sup>+</sup> contains a tetraalkyl ammonium functional group.
8. (Original) The zwitterionic imide compound according to claim 7, wherein alkyl substituents of said tetraalkyl ammonium functional group contain 1 to 8 carbons.
9. (Original) The zwitterionic imide compound according to claim 1, wherein R<sub>1</sub> is a highly halogenated hydrocarbon group.
10. (Original) The zwitterionic imide compound according to claim 1, wherein R<sub>1</sub> is a highly fluorinated hydrocarbon group.
11. (Original) The zwitterionic imide compound according to claim 8, wherein R<sub>1</sub> is a highly halogenated hydrocarbon group.
12. (Original) The zwitterionic imide compound according to claim 8, wherein R<sub>1</sub> is a highly fluorinated hydrocarbon group.
13. (Original) The zwitterionic imide compound according to claim 1 having a melting point of less than 100°C.
14. (Original) The zwitterionic imide compound according to claim 10 having a melting point of less than 100°C.
15. (Original) The zwitterionic imide compound according to claim 12 having a melting point of less than 100°C.
16. (Original) The zwitterionic imide compound according to claim 1 having a solubility in water of less than 5% by weight.

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17. (Original) The zwitterionic imide compound according to claim 12 having a solubility in water of less than 5% by weight.

18. (Original) The zwitterionic imide compound according to claim 15 having a solubility in water of less than 5% by weight.

19. (Withdrawn) A zwitterionic liquid having a melting point of less than 100°C.

20. (Withdrawn) The zwitterionic liquid according to claim 19 which is an aromatic zwitterionic liquid.

21. (Withdrawn) The zwitterionic liquid according to claim 19 having a solubility in water of less than 5% by weight.

22. (Withdrawn) The zwitterionic liquid according to claim 21 which is an aromatic zwitterionic liquid.

23. (Withdrawn) A polymer electrolyte membrane having absorbed therein the zwitterionic imide compound according to claim 1.

24. (Withdrawn) A polymer electrolyte membrane having absorbed therein the zwitterionic imide compound according to claim 8.

25. (Withdrawn) A polymer electrolyte membrane having absorbed therein the zwitterionic imide compound according to claim 12.

26. (Withdrawn) A polymer electrolyte membrane having absorbed therein the zwitterionic liquid according to claim 19.

27. (Withdrawn) An electrochemical device comprising the polymer electrolyte membrane according to claim 23.

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28. (Withdrawn) An electrochemical device comprising the polymer electrolyte membrane according to claim 24.

29. (Withdrawn) An electrochemical device comprising the polymer electrolyte membrane according to claim 25.

30. (Withdrawn) An electrochemical device comprising the polymer electrolyte membrane according to claim 26.

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**Evidence Appendix**

None.

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**Related Proceedings Appendix**

None.